VIDYĀPATI AS AN ASTRONOMER

Dr. PARMESHWAR JHA

The celebrated poet Vidyāpati was a Versatile genius. He was an able and discriminate scholar of Purāṇas and Smṛtis and was equally at home in Sanskrit, Avahaṭṭa and Maithilī languages. He was not only a courtier, but a lawe-giver and reformer too and composed a large number of works on Smṛti, Dharmaśāstra, narrative Kāvya, story, drama, lyrics etc.[1] dealing with religious, social, cultural and literary aspects of Maithila life. He was the most popular poet of Mithilā and the greatest poet of the eastern India. His Padāvalī contains different types of songs—love, devotional, occasional, riddles and others which are brilliant poetic feats and bear the impression of his vast learning. His Padas (lyrics) became immediately so popular that these were on the lips of scholars as well as those of the illiterates and thus became the eternal heritage of the vast Indian people. His contributions to literature attracted the attention of scholars in different ages. Consequently a lot of studies has been made in this regard and a number of books have been written in different languages, viz., Maithilī, Hindi and English. A critical study of other aspects of his writings is yet a desideratum. One of such hitherto untouched aspects is his achievement in the twin discipline of astronomy and mathematics. This paper is an attempt in this direction.

Vidyāpati was born in about 1350 A. D. in the illustrious Bisaibāra Bishpī family of Maithila Brāhmaṇas of Kāśyapa gotra which had given birth to a host of distinguished scholars like Vīreśvara, Dhīreśvara, Caṇḍeśvara and others who made lasting contributions to the social and cultural life of Mithilā by writing authentic works on Smṛti and Dharmaśastra. Especially Caṇḍeśvara, the Mahāmattaka during the reign of the

1. Mss. of his seventeen works and hundreds of Padas in Maithilī are found to exist these days. In addition to these, we have references of at least five books whose Mss could not have yet been located. cf. Dr. S. M. Jha, Vidyāpati, Patna, 1977, pp. 24ff; Dr. J. K. Miśra, History of Maithilī literature, Delhi, 1976, pp. 69 ff; Dr. I. K. Jha, Vidyāpati-Vimarśa, Patna, 1970 and Dr. Devendra Jha, Vidyāpatika Śṛṅgārika Padak Kāvyaśāstrīya Adhyayana, Patna, 1979, pp. 16 ff.

King Harisiṁhadeo of the Karṇāṭa dynasty wrote his comprehensive compendium of Hindu law in seven books called Ratuākara and also an astronomical treatise namely 'Kṛtya-Cintāmaṇi'.[2] Vidyāpati followed the path led by his ancestors and kept up the tradition. It is gathered that he learnt Vedas, Smṛtis, Purāṇas and literature from his Gurū Mm. Hari Miśra, the uncle of the famous Naiyāyika Pakṣadhara Miśra. Jyotiṣa is supposed to be the Netra (eye) of the Āgama and is placed at the head of the six Vedāṅgas.[3] Hence for the proper understanding of the Vedas it is essential to have a good knowledge of astronomy. As Vidyāpati studied Vedas and Smṛtis in his early life, it is likely that he might have studied Jyotiṣa as well from his Gurū.

Mithilā has been the land of Yajñas. For the performance and observances of festivals, social and religious rites it is very essential to have the correct knowledge of exact time (Muhūrta), exact positions of planets, rising and setting of the Sun and Moon, occurrences of solar and lunar eclipses, etc., which are some of the important aspects of Jyotiṣa. It is gathered that Vidyāpati was the court-Pandita of several Kings and queens of the Oinavāra dynasty and hence it was one of his prime duties to make them and their public know these essential elements of Jyotiṣa. Moreover, astronomers in general were, those days, respected and rewarded by the kings and wealthy persons of the time. These and such other circumstantial evidences force us to believe that our poet must have received the education of astronomical learning in his student days.

There are grounds to believe that the tradition of learning Jyotiṣa was established in Mithilā long before the advent of Vidyāpati. This branch of knowledge developed her at least with Yājñavalkya (1000 B. C.) and since then remained a favourite subject for Maithila scholars. Vṛddha Vācaspati Miśra (9th cent. A. D.), Dāka, Halāyudha, Caṇḍeśvrācārya (12th cent. A. D.), Vidyādhara, Bhaveśa (13th cent. A. D.), Caṇḍeśvara Ṭhākura and others were some of the illustrious names of the land who,

2. The Mss. is available in the Sanskrit University library, Darbhanga. Cf. A Des. Cat. of Rāj Mss., Darbhanga, 1969, p. 70.

3. यथा शिखा मयूराणां नागानां मणयो यथा ।
तद्वेदांग शास्त्राणां ज्योतिषं (गणितं)मूर्ध्नि संस्थितम् ॥
—Śloka 4, Vedāṅga Jyotiṣa edited by R. Sāmśāstry, Mysore, 1926.

in different ages, wrote books original as well as commentative on almost all aspects of astronomy.[4] This rich tradition of Mithilā might have inspired our poet too to make the specialised study of the subject and also to write books and digests on it. This fact is now almost confirmed as the writer of these lines has recently gathered some informations which compel us to believe that Vidyāpati was an author of at least four astronomical treatises, namely, Jyotiṣa-sāra-Sammuccaya, Jyotiṣa-Darpaṇa, Dvaita-Nirṇaya and Varṣa-Kṛtya, Mm. Amṛtanatha Jha, in his work, Kṛtya-Sāra-Samuccaya, has quoted from Vidyāpati's Jyotiṣa-Sāra-Samuccaya[5] for the proof of his statement, while Mm. Parmeśvara Jha[6] and Dr. Umeśa Miśra[7] have in their works referred to Jyotiṣa Darpaṇa and Dvaita-Nirṇaya respectively. Neither they could mention the whereabouts of the MSS. of these works nor other scholars could locate them. Hence no definite informations regarding their contents and other details can be given at this stage. His fourth work, 'Varṣa-Kṛtya' has been popular in Mithilā. It is a work on Dharmaśāstra dealing with the religious and social rites to be performed by an individual throughout the whole year. Here the procedure for performing these rituals as well as methods for calculating the time for their occurrences have been discussed. Moreover opinions of different scholars and his own views as well regarding the consideration of Aticāra and Tithi-dvaita have been explained. Thus from the informations gathered so far we may conveniently conclude that he was a Jyotiṣavida and wrote a number of astronomical texts. Non-availability of the MSS. of most of these works is indicative of the fact that probably those were neglected by the scholars due to popularity of his literary works and were lost in course of time.

Besides this, his extant works on Smṛti, Dharmaśāstra and literature bear witness to the fact that he had a good knowledge of

4. Cf. Dr. P. Jha (present author), Historical background of mathematics and astronomy in Mithilā, Gaṇita-Bhāratī, Vol. IV (1982), Delhi pp. 26-40.
5. तथा च कविवर पंडित विद्यापति कृत ज्योतिः सार समुच्चये—वृश्चिकस्थे, खौ त्यक्त्वा वासरापि त्रयोदश । नवान्नैर्विहितं श्राद्धं धनुष्येव कृतं भवेत् ।

—Kṛtya sāra Samuccaya, edited by Gaṅgādhara Miśra, Benaras, 1953, p. 178.
6. Mithilā-tattva-Vimarśa (Pūravārddha), Darbhanga, 1949, p. 182.
7. Vidyāpati Ṭhākura, Allahabad, 1960, p. 74-75.

astronomy and mathematics. Several examples including the use of technical words of astronomy and their applications are found to exist in these works and even the fundamental rules of addition, subtraction, multiplication and division are found to be applied in some of his padas (lyrics). We, first of all, consider some such examples as found in his Smṛti Works.

Vidyāpati, in his Gaṅgāvākyāvali, while discussing the importance of the bath in the holy river Ganges tells us that the dip in the Ganges on special occasions like solar and lunar eclipses, Cuḍāmaṇi Yoga, Vyatīpāta, kṣaya tithi, Śaṁkrānti, Akṣaya tithi and Akṣaya navamī is more auspicious than that on simple occasions.[8] Further the speaks of the importance of the bath on the occasion of Vāruṇī and Mahāvāruṇī and also gives the definition of the Mahāvāruni.[9] The use of the words, vīz., lunar-solar eclipses, Cuḍāmaṇi Yoga, Vyatīpāta, Śaṁkrānti, etc. indicates that he knew the elements of astronomy.

His work, 'Durgābhaktitaraṅginī' includes different aspects of Phalita Jyotiṣa such as effects of stars and tithis on the affais of human being, method of determining tithis[10], etc.

Purūṣa-Parīkṣā which consists of forty four interesting and lesson-giving stories depicting the picture of social and religious conditions of Mithilā of the time, establishes the fact that Vidyāpati was a great exponent of Vedic and Jyotiṣa learning. In his opinion, Vedic scholars are those who are well versed in all the six Aṅgas (Śikṣā, Vyākaraṅa, Jyotiṣa, Chanda, Kalpa and Nirukti) of the Vedas.[11] He places Jyotiṣa at the top of other Vedāṅgas and calls it as 'Pradeepvat' (lamp-post) of the Vedas.[12] In one of his stories he has talked of Varāhamihira, one of the greatest astronomers of the 5th century A. D. and has also described one of his forecasts made in the court of the King Vikramāditya.[13] Moreover, Jātāka, Śakuna, Svapnavīcāra, Praśnavicāra, Muhūrta,

8. Dr. M. Jha, Vidyāpati Vāṅmaya, Calcutta, 1968, p. 139.
9. Dr. I. K. Jha, (Ref. No. 1), p. 66.
10. Dr. M. Jha, (Ref. no. 8), p. 144.
11. Surendra Jha, Śuman (ed.), Purūṣa-Parīkṣā, Darbhanga, 1970, p. 73.
12. Ibid, p. 111.
13. Ibid, p. 70-71,

Pañcāṇga-making and other aspects of Saṁhītā and Jātaka-Skandhas have been illustrated in different stories of this work. There is a sariśrapa, the leader of the thieves who declares that he has the knowledge of śakuna-śāstra and can understand the voice of a fox.[14] There is again, a king who keeping a golden ring in his fist asks a question 'what is there in my fist' from Śāntidhara, the son of an astronomer, Deodhara.[15] It is also gathered from one of his stories that the counting of numerals upto a very large number, Parārdha (10^{18}) was known to him.[16] Thus our poet through these and other such examples has, in a very lucid way, displaced his knowledge of astronomy and mathematics in his monumental work, Purūṣa-Parīkṣā.

His Padāvalī, 'a celebrated collection of Maithilī Padas' (stray songs) and one of the most popular works in Indian literature, bears testimony to the fact that he had keen interest in astronomy and mathematics. The picture of the conflict between passionate and pathetic sentiments, remorse and longing mood, the down of the youth in a maiden (Nāyikā), her various charming poses, moments of the highest happiness and also those of intensest sorrow, pangs of separation, touching cry (Vilāpa) of a beloved, etc., has been ably depicted in his songs with the help of fundamental rules of arithmetic, numerical words and several other astronomical elements. Applications of these mathematical and astronomical principles in the piece of literature have made his work very charming and unique. Some of his padas (lyrics) elucidating such applications may be seen below :—

'The lotus (Kamala) like face of the maiden (Nāyīkā) has faded due to snowfall līke separation from the lover. The cupid (Madana or Kāmadeva) is burning her body. The maiden talks of that day when her lover kept his head (Mastaka or Siniha) on her feet (Paira or Mīna)'[17]. Here

14. Ibid, p. 24.
15. Ibid, p. 65.
16. Ibid, p. 123 and p. 128.
17. 'प्रथम पचीस अठाइस भेल, ता सम वदन हेम हरिलेल,
पचिस अठारह विष तनु जार. छिति सुत तेसर से जिव भार,
सुमिरिअ माधव से दिन सिनेह जे दिन सिह गेल मीनक गेह ।'
—Mitra-Majumdar, Vidyāpati, Calcutta 1951, Gita no. 576.

the words are formed with the help of serial number of alphabets of the Deonāgarī script. The first consonant alphabet is 'Ka', the 25th is 'Ma' and the 28th 'La' and these three together form the word 'Kamala' (lotus). Again the 25th, 18th and 20th alphabets are 'Ma', 'Da', and 'Na' respectively which constitute the word 'Madana' (cupid). 'Kṣitisuta' is the planet Mangala (Mars) and in its third place is Śukra (Venus). Then again from the astrological point of view, when Mars is in its third place, it is called Markeśa which is very harmful. The two Zodiacs (Rāśis), namely Siṁha (Leo) and Mīna (Pisces) are generally represented by 'Ma' and 'Pa' which mean 'Mastaka' (head) and 'Paira' (foot). Thus the planets, Zodiacs and their relations have been used by the poet for expressing the feelings of a maiden in her separation.

Again the longing and restlessness of the maiden for her lover is described with the help of fundamental rules of arithmetic, numerical words and their similar sounds (Bhāṣā-Sāmya) in the following Pada (lyric) :—

'Murāri, the lover of the maiden left the house mysteriously. Her age is now four times that of the age at the time of separation. The age is $11+5=16$ years. Three times of thirty, i.e. 90 (Nabbe, i.e., new age) is not ever lasting. He (her lover) did not consider that the period of enjoyment (Vilāsa) is limited up to that number which when multiplied by 4 becomes 100, i.e., upto 25 years of age only. He has left for her only half of the forty i.e., twenty (Biṣa), i.e., the poison of separation and now there is no other alternative'.[18]

Further the poet expresses the intense sorrow of the maiden in the following way :—

'O Mādhava ! I could now know your conspiracy. You could not agree to stay inspite of my 5 2 10 10 100 100 100000 (one lac) of oaths (Śapatha) given to you. You left me away though I am 40–4=

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18. 'भरम भवन तेजि गेलाह, मुरारि, जे देखि गेलाह्व तेकर गुन चारि
प्रथम एगारह फेरि दिअ पाँच तीसक तेगुन थोड़े दिन साँच
जेकर चौगुन सय लिअक विचारि तें तेहि भल नहि कहथि मुरारि
चालिस काटि अधा हरि देल तें मोर जीवन एहन सन भेल।'

$36 \div 4 = 9$ ie, nava (or new). Who can tolerate the columny (Upahāsa) cut by $60-10=50$ less zeo ie, 5 persons (Panca) ? Now, in your absence I shall take two drops (Do Vindu) of poison. My Prāṇa which is like nine on the left side of nine points ie, Nava Padma (ie, new lotus) cannot now see your face'.[19] What a beautiful expression is it ? Indeed, it is all due to the use of numerals and application of similar sounds corresponding to them.

Again in this connection the following Pada may be observed :—

'O Mādhava ! you left me just in the nick of time and came late and therefore you should not be angry. You promised to return within half of 360 ie, within 180 days (ie, six months), but returned after 360 multiplied by six, ie, after six years'.[20]

Simple rules of addition and multiplication have been used in the following stanza :—

'The lover of a maiden left her at the age of the feet of the bee (Bhramara) multiplied by two ie, $6 \times 2 = 12$ years, but now she became a lady of $12 + 4 = 16$ years'.[21]

Again for expressing the number of Gopīs the simple rule of multiplication has been applied :—

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19. माधव आव बुझल तुअ साजे ।
पाँच दुगुन दस गुन सए गुन पुनि, से देलह कोन काजे ।।
चालिस चारि काटि चौठाई से हम से पिआ मोरा ।
से निरखैत मुख पेखैउ चौदिस, करत जनम के ओरा ।।
साठिहु मह दह विन्दु विवरजित, के से सहत उपहासे ।
हम अवला अब पहुक दोस सँ दुइ विन्दु करन गरोसे ।।
नव बुंदा दए नवए बाम कए से डर हमर पराने ।
कपटो वालम हेरि न हेरए, कारन के नहि जाने ।।'
—Rāmabṛkṣa Benīpurī, Vidyāpati, Padāvalī, Patna, 1975, Pada no. 260.

20. 'माधव मन जनु राखिए रोसे ।
अवसर तेजि कतय चल गेलहुँ, ताहि हमर कोन दोसे ।
तीन सै साठि आध मिन्हा दै, से कै गेलहुँ ठिकाने ।
ता दो गुन तकरो पुनि षट गुन, अयलहुँ तकरो निदाने ।
—Quoted by Dr. G. N. S. Jha, Mithila-Mihira, 14th. Feb., 1982, p. 9.

21. 'दुई गुन चरण भ्रमर तेजि गेल, चारि मिलाय वयस मोर भेल ।'

'The lord Kṛṣṇa lives among $5 \times 5 \times 10 \times 4 \times 8 \times 2 = 16000$ cowherdesses (Gopīs) while, on the other hand, Rādhā, his beloved, is suffering from the pangs of separation'.[22]

Moreover, Vidyāpati has depicted the picture of almost all aspects of a lunar eclipse on the moon like face of a damsel in one of his lyrics[23]. This indicates that he had the knowledge of lunar eclipse as well.

It is also gathered from his works that the usage of words for numerals prevalent those days in astronomical works and the principle of 'Aṅkānāṃ Vāmto Gatiḥ' were known to the poet. He has expressed the date of death of the King, Devasiṁha corresponding to the date of coronation of his patron Mahārājā Śiva Siṁha in the following way :—

'In fire (3), sky (9), hands (2) of Lakṣamaṇa Saṁvata; in seas (4), hands (2), fire (3) and Śasī (1) of Śaka in the dark Caitra on the 6th, Jeṣṭha nakṣatra, the day being Vṛhaspati Deva Siṁha went to the city of gods and Śiva Siṁha assumed high powers'[24], ie., Deva Siṁha died on Thursday, Jeṣṭha Nakṣatra, Ṣaṣṭhī Kṛṣṇa Pakṣa of the Caitra month of the L. S. 293 or Śaka 1324.

It is also believed that Vidyāpati was an expert in describing a thing which was out of his sight and hidden from him. Tradition asserts that his patron Śiva Siṁha once was defeated and imprisoned by Ibrahim Shah, the Emperor of Delhi. Our poet hastened to Delhi, appeared before the Emperor and declared his ability to see things hidden from him as if they were before his eyes. He was tested by the Emperor and in that

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22. 'पाँच गुन दस गुन चौगुन आठ दुगुन सखि माझे।
विद्यापति मन आकुल तुअ बिनु विसरि न पावसि लाजे ॥
—Pada no. 148, [Ref. no. 19].

23. 'उठ-उठ माधव कि सुतसि मंद । गहन लाग देखु पुनिम क चंद ।
—Nāgārjuna, Vidyāpati ke Gīta, Delhi, 1972, Gīta no. 59.

24. 'अनल रन्ध्र कर लक्खण णखइ सक समुद्ध कर अगिन ससी ।
चैंत कारि छठि जेठा मिलिओ वार, वेहप्पइ जाउ लसी ॥
देवसिंह जं पुहमी छड्डइ अद्धासन सुरराअ सरु ।
सिंहासन शिवसिंह बइको उछैव बेरस बिसपी गओ ॥'
—Gita no. 8, [Ref. no. 17].

context the song 'Kāminī Karai Sanāne'[25]........was composed. The Emperor was still not satisfied with his astronomical feats. The poet was then put in a wooden box which was hung in a well by a rope and was asked to describe the scence above the well. He described it correctly which was a scene of a lady liting fire in the following words :—

'Sundari Nihuri Phuku Āgi........ Having performed miracles he pleased the Emperor so much that the latter ordered Śiva Siṁha's release immediately and gave the poet the village of Bisphī which was later on given to him by Śiva Siṁha himself.[26]

Several such examples are found to exist in his Padas (lyrics) and other literary and Smṛti works which prompt us to conclude that astronomical and mathematical principles were known to our celebrated poet Vidyāpati. As we have seen above, some astronomical works are also ascribed to his authorship, but Mss. of all of them are not available at present. It is just possible that his literary works became so popular among the scholars of the later period that their attention could not be directed to his astronomical writings which might have been lost due to ravages of time. Hence there is the need for hunting various repositories of Mss. for procuring such works of the poet. If we endeavour in this direction and some of his lost works are brought to light, then only we will be able to say something definite as to what extent he has contributed to the twin discipline of astronomy and mathematics.

Reader and Head,
Department of Mathematics,
B. S. S. College,
Supaul (Saharsa)

25. Dr. Śubhadra Jha, The Songs of Vidyāpati, Benaras, 1954, Gita no. 197.
26. Cf. 'Dr. U. Thakur, History of Mithila, Darbhanga, 1956, p. 311 (f. n.) and also Mm. Umeśa Miśra, Vidyāpati Ṭhākura, Allahabad, 1960, pp. 25-26.

THE JOURNAL

OF

THE BIHAR RESEARCH SOCIETY

Vols. LXXIV & LXXV January-December 1988-89 Pts. I-IV

Chief Editor

UPENDRA THAKUR



PUBLISHED BY

THE BIHAR RESEARCH SOCIETY

PATNA